UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
OREGON OPERATIONS OFFICE
805 SW Broadway, Suite 500
Portland, Oregon 97205

July 9 2009

Mr. Robert Wyatt
Northwest Natural & Chairman, Lower Willamette Group
220 Northwest Second Avenue
Portland, Oregon 97209

Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240 – Treatment Technology Screening Tables

Dear Mr. Wyatt:

EPA has reviewed the Draft Treatment Technology Screening Tables (Screening Tables) dated June 5, 2009. The Treatment Technology Screening Tables are a follow-up to the Draft Treatability Study Literature Survey Technical Memorandum (Literature Survey), dated October 20, 2007. The stated purpose of the technical memorandum was to provide information on the potential suitability of various technologies for the treatment of sediments associated with the Portland Harbor Superfund Site. EPA's previous comments on the Literature Survey focused on:

- Recognition that the status of sediment treatment technologies is rapidly evolving.
- Screening of treatment technologies based primarily on cost and effectiveness.
- The hybridization of sediment remediation and treatment options.
- The potential for the beneficial re-use of contaminated sediments.

In general, EPA believes that these previous comments have been addressed. For example, the Screening Tables include a "Compatible GRA or Pre-Treatment" and two Beneficial Use columns in this evaluation. In addition, while siting and permitting are identified as a consideration, it appears that the evaluation of treatment technologies was based primarily on cost and effectiveness. Finally, and most significantly, EPA believes that the set of retained or tentatively retained treatment technologies are generally appropriate for the Portland Harbor FS.

General and technology specific comments are attached. These comments should be considered as we move forward with the development and screening of remedial alternatives. If you have any questions, please contact Chip Humphrey at (503) 326-2678 or Eric Blischke (503) 326-4006. All legal inquiries should be directed to Lori Cora at (206) 553-1115.

Sincerely,

Chip Humphrey
Eric Blischke
Remedial Project Managers

cc: Greg Ulirsch, ATSDR
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EPA Comments on Pre-Feasibility Study Treatment Technologies Table
July 10, 2009

General Comments:

Because the site is relatively large and has a variety of COCs and physical characteristics that vary across the site, it should be made clear that a single process option may not be selected or desirable to represent the technology for the entire site. It may be necessary, as the FS proceeds, to allow for a number of process options to be applied based on the situation at various AOPCs and SMAs at the site, and possibly combinations of process options. At this point it may only be possible and useful to eliminate options that are completely outside of the range of possibilities so there are still a variety of options that can be considered when the FS is developed.

As we move into the screening of remedial action alternatives and the FS, elaboration on information presented in the table will be required. For example, under "Demonstrated Effectiveness" statements such as "Moderate" or "High" are included. However, the effectiveness of the treatment technology may depend on the factors such as sediment type, COCs and required levels of treatment. Quantitative information will be needed for the screening and evaluation of remedial action alternatives. It should be noted that the cost column is similar in format, but cost amounts are placed in the footnote, which provides the required level of quantitative detail.

The basis for screening out Ex-Situ biological treatment technologies is probably premature. No consideration was given to combining treatment technologies (such as composting and land application) for a GRA. Composting sediments with sludge or other products (e.g. woodchips) could be used to enrich poor soils as part of a land treatment technology. Consideration of cost vs. benefit should also be considered in this scenario as well.

Regulatory requirements and risk management goal attainment may determine treatment goals. The FS should identify any regulatory or other requirements and evaluate whether a specific process option can meet those endpoints.

It is unclear whether the technologies presented in the Screening Tables have been demonstrated on sediments. It would be helpful to differentiate between technologies demonstrated generally and for sediments.

Time to achieve goals should be expressed as treatment time. As it stands, it appears that the actual treatment time for some of these processes is days, when the actual residence time in the system is minutes. Where a continuous feed process is involved, total treatment time will be a function of total volume processed.

Technology Specific Comments:

1. In the table, composting was tentatively ruled out. However land treatment, described immediately above in the table, had identical language to composting. The rationale of screening out composting because of increased treatment residuals, isn’t explicitly related to the effectiveness, implementability, and cost factors. If the technology is screened out

due to higher costs associated with material handling and/or disposal, this should be reflected in the treatment cost column for the composting (showing a higher cost than land treatment).

2. Under thermal treatment, incineration is tentatively screened out. Incineration may be a required treatment option for a RCRA-listed waste prior to land disposal of treated residuals. If a process option is potentially required for legal reasons, it should be retained for analysis in the FS, at least until a thorough ARARs or waste disposal requirements analysis is completed.

3. Under incineration and pyrolysis both state that transportation costs are high. Mobile treatment may be used, if available, and may more cost effective than offsite thermal treatment if the treatment volumes are high enough. The technology has been used at number of sites around the country. Implementability of onsite treatment is likely to be challenging, due to public concern about the use of such technology. But for screening purposes, to screen out certain technologies based on transportation costs may be premature.

4. The thermal desorption rationale mentions the potential for dioxin generation. Without performing a detailed process option technical analysis, that conclusion is surprising because the temperatures for thermal desorption are usually lower than the point where dioxins would be formed. Even if they were formed within the desorption unit or were part of the desorbed organic material, air pollution controls can be effective in treating the emissions.

5. All Biological/chemical in-situ methods are tentatively screened out, and a prime implementability consideration is that "Treatment area is extensive." As noted previously, the possibility of applying the process option to more limited areas, perhaps within AOPCs or SMAs, should be considered.

6. The table states that Geotextile Tube Dewatering is "not regularly implemented." EPA disagrees with this statement. The Fox River and Ashtabula have used geotextile tubes to dewater large volumes of contaminated sediment. It should also be noted that at the Ashtabula River, sediments were piped approximately 3 miles to the dewatering site. Geotextile tubes may work for fine-grained sediments with proper coagulant treatment. In addition, bench scale testing is required to identify appropriate flocculants and dosages.

7. EPA notes that variations of land treatment (e.g., composting and biopiles) were tentatively screened out. EPA acknowledges that the presence of site COCs such as PCBs, organochlorine pesticides and metals may prevent these technologies from achieving the desired cleanup levels. In addition, land treatment may have similar space requirements as to technologies such as composting and biopiles.

8. Chemical extraction was tentatively screened out based on "limited effectiveness in treating PCBs" and because it “less demonstrated on a full scale basis than some other process options.” It should be noted that chemical extraction was successfully pilot-

demonstrated at New Bedford Harbor which is contaminated with PCBs. Where metals and organics are both present in the sediment, which is typical, chemical extraction targeting organics would likely need to be coupled with other operations addressing removal/stabilization of metals.

9. Thermal processes: Allowable content and implementability concerns related to permitting should be described. It should be noted that for vitrification, sediments must be dried to a very low water content, thus dewatering and drying would be required for both mechanical and hydraulically dredged materials. Some thermal technologies require removal of relatively small metallic debris.

10. Vitrification: Extended duration tests have been done with near full scale equipment, but how you define full scale is certainly an issue. If the treatment process can be separated from the dredging process (which requires staging/storage areas and rehandling), the capacity of the treatment process does not need to be as high and the scale of at least some demonstrations to date may be fairly representative. Scale up to capacity corresponding to dredge production has likely not been done for the thermal technologies.

11. Dewatering: The relative cost of dewatering operations mentioned varies considerably but is not addressed. Degree of debris removal required varies depending upon the requirements of the dewatering equipment and any follow-on treatment processes.

12. Mechanical Dewatering: Belt filter press circuits are continuous flow processes. Residence time is a matter of minutes. Plate and frame presses are batch processes, usually operated in parallel to achieve continuous operation. Residence time may be longer than for belt filter presses, but probably on the order of minutes to hours. In addition, mechanical dewatering typically requires a slurry feed from a hydraulic dredging operation. Bench scale testing would be needed to determine operational parameters and requirements

13. Reagent Dewatering: It should be noted that this operation is often performed on a barge negating the need for upland processing facilities.

14. Blending: Blending, in and of itself, is essentially only dilution, not treatment. Blending with other materials is sometimes done as part of a compositing operation. This needs some clarification.

15. Particle Separation: Bench scale testing to characterize the different size or density fractions is typically needed to assess feasibility. It cannot be assumed that coarse materials will be uncontaminated. The presence of condensed carbon phases and natural organic matter can result in higher concentrations in coarse size fractions than in fine. With physical separation, no contaminant destruction takes place, therefore there will be residual materials requiring management and/or disposal.

16. Cement Stabilization/Solidification: The question of whether dewatering is required prior to cement stabilization/solidification may be a question of logistics. Mechanically

dredged sediments will be saturated, but since the volumes of water produced by mechanical dredging are much more limited, blending with stabilizing agents can be done in barges on wet materials. Where hydration of the blending agent is required, some water would actually be desirable. A similar operation could be performed on hydraulically dredged sediments after they have become sufficiently dewatered (passively) to permit handling, or after they were mechanically dewatered. The rehandling would result in additional cost, however.

17. Processes that have only been demonstrated at bench scale are going to require some additional bench and/or pilot scale testing to establish operating parameters. This comment applies to all technologies listed that have only been demonstrated at bench scale.

18. Sediment Washing: While organics may be oxidized through addition of certain reagents, metals will largely be transferred to the aqueous phase, producing a large wastewater volume that must be managed. In addition, as noted for some dewatering methods, process residence time is limited to the time required for the slurry to be pumped/flow through the various unit operations. Recycle may be required to achieve sufficient contaminant reduction in some cases, however, which would incrementally increase residence times.